PB-239 702

SEBASTICOOK LAKE, PENOBSCOT COUNTY, MAINE

Pacific Northwest Environmental Research Laboratory

Prepared for:

Maine National Guard
Maine Department of Environmental Protection
National Environmental Research Center

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16. ABSTRACT
Annual total phosphorus and total nitrogen loadings to the lake were estimated and subdivded according to either point or non-point source origin. An assessment of the lake's trophic condition and limiting nutrient is also provided. All data collected by the U.S.E.P.A. National Eutrophication Survey during the one year study of the lake and its tributaries are included in the report.

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REPORT
ON
SEBASTICOOK LAKE
PENOBSCOT COUNTY
MAINE

EPA REGION V

WORKING PAPER No. 9

WITH THE COOPERATION OF THE

MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION

AND THE

MAINE NATIONAL GUARD

JUNE, 1974

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FOREWORD

The National Eutrophication Survey was initiated in 1972 as a research project in response to an Administration commitment to investigate the nationwide threat of accelerated eutrophication to fresh water lakes and reservoirs.

OBJECTIVES

The Survey was designed to develop, in conjunction with state environmental agencies, information on nutrient sources, concentrations and impact on selected fresh water lakes as a basis for formulating comprehensive and coordinated national, regional and state management practices relating to point-source discharge reduction and non-point source pollution abatement in lake watersheds.

ANALYTIC APPROACH

The mathematical and statistical procedures selected for the Survey's eutrophication analysis are based on related concepts that:

a. A generalized representation or model relating sources, concentrations and impacts can, in fact, be constructed.

b. By applying measurements of relevant parameters associated with lake degradation, the generalized model can be transformed into an operational representation of a lake, its drainage basin and related nutrients.

c. With such a transformation, an assessment of the potential for eutrophication control can be made.

LAKE ANALYSIS

This report documents the first stage of evaluation of lake and watershed data collected from the study lake and its drainage basin. It is formatted to provide state environmental agencies with specific information for basin planning [§303(e)], water quality criteria/ standards review [§303(c)], clean lakes [§314(a,b)], and water quality monitoring [§106 and §305(b)] activities mandated by the Federal Water Pollution Control Act Amendments of 1972.

Beyond the single lake analysis, broader based correlations between nutrient concentrations (and loading) and trophic condition are being made to advance the rationale and data base for refinement of nutrient water quality criteria for the Nation's fresh water lakes. Likewise, multivariate evaluations for the relationships between land use, nutrient export and trophic condition, by lake class or use, are being developed to assist in the formulation of planning guidelines and policies by EPA and to augment plans implementation by the states.

ACKNOWLEDGMENT

The staff of the National Eutrophication Survey (Office of Research & Development, U. S. Environmental Protection Agency) expresses sincere appreciation to the Maine Department of Environmental Protection for professional involvement and to the Maine National Guard for conduct of the tributary sampling phase of the Survey.

William R. Adams, Commissioner of the Department of Environmental Protection, and William P. Hinckley and Matthew Scott of the Division of Lakes and Biological Studies, provided invaluable lake documentation and counsel during the course of the study.

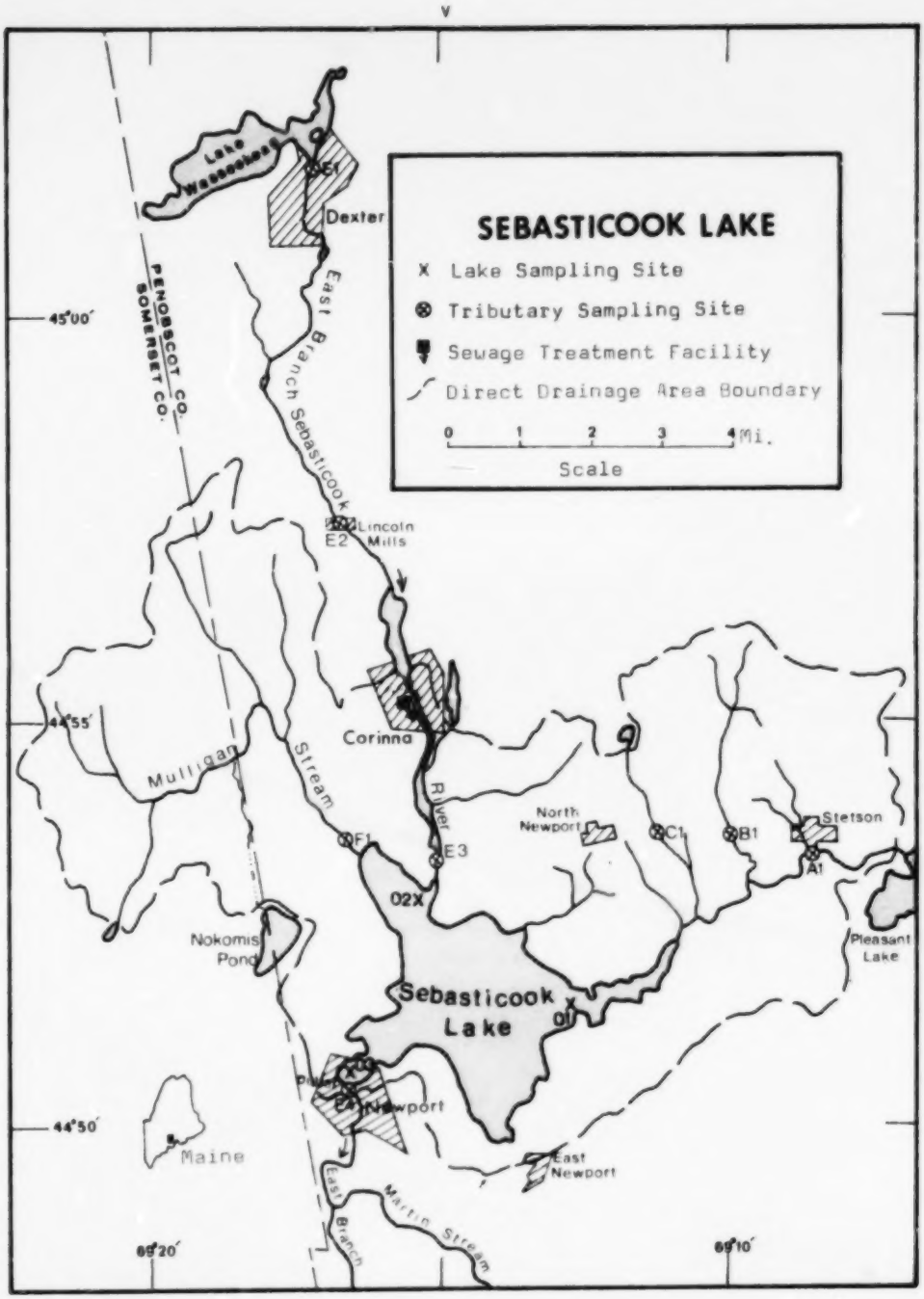
Major General Edwin W. Heywood (Retired), then the Adjutant General of Maine, and Project Officer Lieutenant Colonel Earl B. Adams who directed the volunteer efforts of the forty-one participating Maine National Guardsmen are also gratefully acknowledged for their assistance to the Survey.

NATIONAL EUTROPHICATION SURVEY

STUDY LAKES

STATE OF MAINE

LAKE NAME	COUNTY
Moosehead Lake	Piscataquis, Somerset
Estes Lake	York
Long Lake	Cumberland
Bay of Naples & Sebago Lake	Cumberland
Rangeley Lake	Franklin
Long Lake	Aroostook
Mattawamkeag Lake	Aroostook
Sebasticook Lake	Penobscot


SEBASTICOOK LAKE
X Lake Sampling Site
⊗ Tributary Sampling Site
Sewage Treatment Facility
Direct Drainage Area Boundary
0 1 2 3 4 Mi.
Scale
Lake Wassookeag
E1
Dexter
PENOBSCOT CO.
SOMERSET CO.
East Branch Sebasticook
45°00'
E2
Lincoln Mills
Corinna
44°55'
Mulligan
Stream
River
F1
E3
North Newport
C1
B1
Stetson
A1
02X
Nokomis Pond
Sebasticook Lake
01
Pleasant Lake
44°50'
Maine
East Newport
East Branch
Martin Stream
69°20'
69°10'

SEBASTICOOK LAKE

STORET NO. 2312

I. CONCLUSIONS

A. Trophic Condition:

Sebasticook Lake is a eutrophic water body. Reportedly. nuisance blooms of algae have occurred periodically in the lake for many years.

B. Rate-Limiting Nutrient:

The algal assay results and lake data indicate Sebasticook Lake was nitrogen limited at the time the assay sample was collected. Lake data also indicate nitrogen limitation during the other sampling periods.

C. Nutrients; Controllability:

1. Point sources--The survey data indicated that the communities of Dexter and Corinna contributed about 70% of the total annual phosphorus load to Sebasticook Lake. If 80% removal of total phosphorus at these two point sources were instituted, the total annual phosphorus load to Lake Sebasticook would be reduced to 44% of its present level.

It is believed that this degree of reduction of the total phosphorus load would result in a persistent phosphorus limitation and would reduce or eliminate nuisance algal blooms.

2. Non-point sources--Of the total non-point source input, the greatest contribution is made by drainage from the East Branch of the Sebasticook River which inputs 15% of the annual phosphorus load and 32% of the annual nitrogen load.

II. INTRODUCTION

Sebasticook Lake is located on the East Branch of the Sebasticook River in south-central Maine (see map, page v). The watershed is primarily rolling hills, and the vegetation cover is mainly mixed soft- and hardwood forests. Lake uses are reported to be boating, domestic water supply, fishing, hunting, trapping, and swimming.

The lake has experienced nuisance algal blooms for many years along with excessive weed growths. Reportedly, chemical control with sodium arsenite (1959, 1960, and 1962) and copper sulfate (1964) has been done for the Sebasticook Lake Association by a private consulting firm.

Past studies have indicated excessive amounts of nutrients entering Lake Sebasticook via the East Branch of the Sebasticook River (Anonymous, 1966; Mackenthun, et. al., 1968).

Sebasticook Lake is classified as a eutrophic lake and water quality is said to have changed little during the past decade.

III. LAKE AND DRAINAGE BASIN CHARACTERISTICS

A. Lake Morphometry:

1. Surface area: 4,288 acres.
2. Mean depth: 19.7 feet.
3. Maximum depth: 58 feet.
4. Volume: 84,473 acre/feet.
5. Mean hydraulic retention time: 200 days.

B. Tributary and Outlet:
(See Appendix A for flow data)

1. Tributaries -

Name	Drainage area†	Mean Flow†
Sebasticook River - East Branch	55.8 mi^2	94.3 cfs
Stetson Stream	13.4 mi^2	22.4 cfs
Mulligan Stream	20.8 mi^2	37.2 cfs
Minor tributaries & immediate drainage -	29.0 mi^2	58.6 cfs
Totals	119.0 mi^2	212.5 cfs

2. Outlet -

Sebasticook River - East Branch	126.0 mi^2*	212.5 cfs

C. Precipitation**:

1. Year of sampling: 48.5 inches.
2. Mean annual: 38.2 inches.

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* Includes area of lake.
** See Working Paper No. 1, "Survey Methods".
† Drainage areas are accurate within ±1% and mean annual flows within ±5%.

IV. LAKE WATER QUALITY SUMMARY

Sebasticook Lake was sampled three times during the open-water season of 1972 by means of a pontoon-equipped Huey helicopter. Each time, samples for physical and chemical parameters were collected from three stations on the lake and from a number of depths at each station (see map, page v). During each visit a single depth-integrated (near bottom to surface) sample was composited from the three stations for phytoplankton identification and enumeration; and during the last visit, a single five-gallon depth-integrated sample was collected for algal assay. Also each time, depth-integrated samples were collected at the stations for chlorophyll a analysis. Maximum depths sampled were 10 feet at station 1, 14 feet at station 2, and 10 feet at station 3.

It should be noted that the Survey Secchi disc values are consistently less than those observed by the Maine Department of Environmental Protection. Such variations could be attributed to fluctuations in cloud cover or sun angle (ambient light conditions), observer technique, water surface disturbance, or may, in fact, be the result of short-term water clarity differences.

The results obtained are presented in full in Appendix B, and the data for the fall sampling period, when the lake was essentially well-mixed, are summarized below. Note, however, the Secchi disc summary is based on all values.

For differences in the various parameters at the other sampling times, refer to Appendix B.

A. Physical and chemical characteristics:

FALL VALUES

(10/03/72)

Parameter	Minimum	Mean	Median	Maximum
Temperature (Cent.)	15.1	15.8	15.8	16.0
Dissolved oxygen (mg/l)	7.5	9.0	9.0	10.0
Conductivity (μmhos)	140	140	140	140
pH (units)	7.3	7.6	7.7	8.0
Alkalinity (mg/l)	29	29	29	30
Total P (mg/l)	0.075	0.081	0.075	0.092
Dissolved P (mg/l)	0.026	0.028	0.028	0.030
NO_2 + NO_3 (mg/l)	0.040	0.040	0.040	0.040
Ammonia (mg/l)	0.050	0.063	0.050	0.090
ALL VALUES				
Secchi disc (inches)	31	44	39	72

B. Biological characteristics:

1. Phytoplankton* -

Sampling Date	Dominant Genera	Number per ml
06/08/72	1. Fragilaria	122
	2. Melosira	95
	3. Cryptomonas	45
	4. Stephanodiscus	27
	5. Synedra	7
	Other genera	31
	Total	327
10/03/72	1. Fragilaria	3,660
	2. Flagellates	1,283
	3. Chroococcus	906
	4. Anabaena	528
	5. Dinobryon	453
	Other genera	2,378
	Total	9,208

* The August phytoplankton sample was lost in transit.

2. Chlorophyll *a* -
(Because of instrumentation problems during the 1972 sampling, the following chlorophyll values may be in error by plus or minus 20 percent.)

Sampling Date	Station Number	Chlorophyll *a* (µg/l)
06/08/72	01	5.0
	02	63.9
	03	22.9
08/07/72	01	96.1
	02	21.3
	03	15.8
10/03/72	01	98.9
	02	80.0
	03	41.2

C. Limiting Nutrient Study:

1. Autoclaved, filtered, and nutrient spiked -

Spike (mg/l)	Ortho P Conc. (mg/l)	Inorganic N Conc. (mg/l)	Maximum Yield (mg/l-dry wt.)
Control	0.037	0.280	8.3
0.006 P	0.043	0.280	8.7
0.012 P	0.049	0.280	9.0
0.024 P	0.061	0.280	9.0
0.060 P	0.097	0.280	8.1
0.06 P + 10.0 N	0.097	10.280	25.6
10.0 N	0.037	10.280	13.3

2. Discussion-

The control yield of the assay alga, *Selenastrum capricornutum*, indicates that the potential primary productivity of Sebasticook Lake was high at the time the assay sample was collected.

The yield response to increased levels of orthophosphorus was not significantly different from the control yield, but

the addition of nitrogen produced a significant increase in yield. This indicates that the lake was nitrogen limited at the time the sample was collected. This conclusion is substantiated by the lake data which indicate nitrogen-to-phosphorus ratios to be less than 14:1 at all sampling periods (nitrogen limitation would be expected with N/P ratios of less than 14:1).

Data from a previous study (Mackenthun, et. al., 1968) indicate nitrogen was limiting in the October-November samples and in the profundal waters in February, but that phosphorus was limiting at all other times of the year.

Data from another study (Hall, 1974) indicate nitrogen limitation from June through October in 1971. Phosphorus limitation was indicated for the winter and spring months of 1971 in surface waters, and nitrogen was limiting in the deeper waters during the same period of time.

D. Trophic Condition:

Sebasticook Lake has been eutrophic for many years. A Federal Water Pollution Control Agency report (Anonymous, 1966) characterized the lake as having almost continuous blooms of nuisance algae, rather high concentrations of chlorophyll a, and depression or depletion of dissolved oxygen with depth.

During the Survey sampling year, the lake exhibited essentially the same characteristics noted above. Heavy algal blooms were

observed during the August and October sampling visits, chlorophyll *a* concentrations were high, and dissolved oxygen was depressed with depth.

V. NUTRIENT LOADINGS*
(See Appendix C for data)

For the determination of nutrient loadings, from September, 1972, through August, 1973, the Maine National Guard collected monthly near-surface grab samples from the tributary sites indicated on the map (page v), except for the high runoff months of April and May, when two samples were collected, and the colder months of the year when one or more samples were omitted, depending on the site.

Stream flow estimates were provided by the Maine District Office of the U.S. Geological Survey through an interagency agreement.

In this report, tributary loads were calculated using mean concentrations and mean flows. The loadings for unsampled "minor tributaries and immediate drainage" ("ZZ" of U.S.G.S.) were calculated from the mean concentrations of the unnamed stream at site B-1 and mean "ZZ" flows.

Discharges from the Corinna wastewater treatment plant were sampled by personnel of the Maine Department of Environmental Protection on a monthly basis, and flow data were provided. However, the untreated sewage discharge from the town of Dexter was not sampled during the survey, and nutrient loadings were based on literature coefficients and estimated contributing population. In this report, it is assumed that all of the loads measured or estimated reached Sebasticook Lake during the sampling year, although Keup (1968) noted a loss of about 29% of the phosphorus in Dexter wastes in a four-mile stretch of the East Branch of the Sebasticook River.

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* Based on sampling frequency and variations in concentrations, single tributary loadings for gaged sites are believed to be within ±16% of the true value 67% of the time and within ±32% of the true value 95% of the time.

Industrial effluents were not sampled. However, these contributions to the loadings of Sebasticook Lake were included in the loads in the East Branch at site E-3.

A. Waste Sources:

1. Municipal -

Name	Pop. Served	Treatment	Mean Flow (mgd)	Receiving Water
Corinna S.D.	2,000	Act. sldg.	1.232	E. Br., Sebasticook River
Dexter	3,725	None	-	E. Br., Sebasticook River

2. Industrial -

Name	Product	Treatment	Mean Flow (mgd)	Receiving Water
Eastland Woolen Co.	textiles	Corinna STP	?	E. Br., Sebasticook River
Eastland Woolen Co.	textiles	bypass	?	E. Br., Sebasticook River

B. Annual Total Phosphorus Loading - Average Year:

1. Inputs -

Source	lbs P/ yr	% of total
a. Tributaries (non-point load) -		
E. Br., Sebasticook River	3,900	15.0
Stetson Stream	620	2.4
Mulligan Stream	1,240	4.8
b. Minor tributaries & immediate drainage (non-point load) -	1,200	4.6
c. Municipal STP's -		
Corinna	5,180	19.9
Dexter*	13,040	50.1
d. Septic tanks** -	190	0.7
e. Industrial -		
Eastland Woolen Co. bypass	?	-
f. Direct Precipitation*	670	2.6
Total	26,040	100.0

2. Outputs-

Lake outlet (E. Br., Sebasticook River)	18,430

3. Net annual P accumulation - 7,610 pounds

* Estimated; see Working Paper No. 1, "Survey Methods".
** Estimated 300 residences on lakeshore.

C. Annual Total Nitrogen Loading - Average Year:
(See discussion, page 13)

1. Inputs -

Source	lbs N/ yr	% of total
a. Tributaries (non-point load) -		
E. Br., Sebasticook River	203,170	32.5
Stetson Stream	31,780	5.1
Mulligan Stream	70,760	11.3
b. Minor tributaries & immediate drainage (non-point load) -	65,670	10.5
c. Municipal STP's -		
Corinna	169,440	27.1
Dexter*	35,020	5.6
d. Septic tanks** -	7,050	1.1
e. Industrial -		
Eastland Woolen Co. bypass	?	-
f. Direct precipitation* -	41,310	6.6
Total	624,200	100.0

2. Outputs -

Lake outlet (E. Br., Sebasticook River	463,700

3. Net annual N accumulation - 160,500 pounds

* Estimated; see Working Paper No. 1, "Survey Methods".
** Estimated 300 residences on lakeshore.

D. Calculation of Nitrogen Loadings:

For the sampling year, it is calculated that the combined nitrogen load from the Corinna STP, the untreated Dexter discharge, and the non-point contribution of the drainage system above the point sources totaled 273,880 pounds; but the N-load at the inlet to the lake was 407,603 lbs/yr--a difference of 133,750 lbs. Part of this difference can be attributed to runoff from the intervening drainage, but some of the difference was probably due to the woolen mill bypassing wastes. However, the N-load given in the table for the East Branch is that measured at station E-1 plus the difference of 133,750 lbs.

It is noted that on a per capita basis, there should have been about 15,000 lbs/yr of nitrogen in the Corinna effluent; but, during the sampling year, it is calculated that the contribution from this source was 169,440 lbs/yr. The difference of 154,440 lbs/yr is attributed to the woolen mill discharges to the Corinna system.

E. Mean Annual Non-point Nutrient Export by Subdrainage Area:

Tributary	lbs P/mi^2/yr	lbs N/mi^2/yr
E. Br., Sebasticook River	70	3,641
Stetson Stream	46	2,372
Mulligan Stream	60	3,402

F. Yearly Loading Rates:

In the following table, the existing phosphorus loading rates are compared to those proposed by Vollenweider (1973). Essentially, his "dangerous" rate is the rate at which the receiving waters would become eutrophic or remain eutrophic; his "permissible" rate is that which would result in the receiving water remaining oligotrophic or becoming oligotrophic if morphometry permitted. A mesotrophic rate would be considered one between "dangerous" and "permissible".

	Total Phosphorus		Total Nitrogen	
Units	Total	Accumulated	Total	Accumulated
lbs/acre/yr	6.1	1.8	145.6	37.4
grams/m^2/yr	0.68	0.20	16.3	4.2

Vollenweider loading rates for phosphorus (g/m^2/yr) based on the mean depth and mean hydraulic retention time of Sebasticook Lake:

"Dangerous" (eutrophic rate)	0.64
"Permissible" (oligotrophic rate)	0.32

G. Controllability of Nutrients:

It is calculated that during the sampling year, the total phosphorus loading to Sebasticook Lake from all sources exceeded

that proposed by Vollenweider as dangerous (i.e., a eutrophic rate). Of that loading, the communities of Corinna and Dexter contributed about 70%.

In the following table, the total phosphorus loading rates that can be achieved by specified levels of phosphorus removal at Corinna and Dexter are shown and compared to Vollenweider's suggested loading rates.

	Total P Loading	
% P Removal	lbs/acre/yr	$g/m^2/yr$
Existing	6.1	0.68
50	3.9	0.44
70	3.1	0.35
80	2.7	0.30
90	2.2	0.25
100	1.8	0.20
Vollenweider:		
"Dangerous" (eutrophic rate)		0.64
"Permissible" (oligotrophic rate)		0.32

It will be noted that 70% removal would reduce the loading rate to just over the permissible level. This degree of reduction would be expected to result in significant improvement of the trophic condition of Sebasticook Lake. However, in view of of the phosphorus resources in the lake it appears that a higher level of removal would be required to shorten the recovery time of the lake.

Matthew Scott of the Maine Department of Environmental Protection advises that the provision of secondary treatment at Dexter has priority over nutrient removal at Corinna. Dexter will probably be funded for preparation of plans in FY 1976, but funding for preparation of plans for nutrient removal at Corinna is not scheduled until FY 1977 with funding for nutrient removal at Dexter some time after that.

VI. LITERATURE REVIEWED

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VII. APPENDICES

APPENDIX A

TRIBUTARY FLOW DATA

TRIBUTARY FLOW INFORMATION FOR MAINE 6/25/74

LAKE CODE 2312 SEBASTICOOK LAKE

TOTAL DRAINAGE AREA OF LAKE 126.00

TRIBUTARY	SUB-DRAINAGE AREA	NORMALIZED FLOWS JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	MEAN
2312A1	13.40	22.00	22.00	71.00	65.00	20.00	9.30	2.90	2.00	3.40	5.20	25.00	22.00	22.45
2312E3	55.40	86.00	73.00	240.00	302.00	101.00	48.00	16.00	10.00	18.00	28.00	119.00	92.00	94.29
2312E4	126.00	213.00	170.00	509.00	648.00	245.00	113.00	41.00	27.00	42.00	66.00	257.00	225.00	212.78
2312F1	20.40	33.00	23.00	58.00	122.00	54.00	22.00	10.00	6.90	10.00	16.00	49.00	43.00	37.21
2312Z7	35.70	71.00	52.00	140.00	159.00	71.00	33.00	12.00	7.90	10.00	16.00	64.00	68.00	58.63

SUMMARY

TOTAL DRAINAGE AREA OF LAKE = 126.00
SUM OF SUB-DRAINAGE AREAS = 125.70
TOTAL FLOW IN = 2553.60
TOTAL FLOW OUT = 2556.00

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2312A1	9	72	11.00	16	5.20				
	10	72	7.90	14	6.10				
	11	72	50.00	4	43.00				
	12	72	35.00	2	56.00				
	1	73	37.00	6	26.00				
	2	73	72.00	3	104.00				
	3	73	209.00	3	48.00				
	4	73	81.00	7	45.00	21	105.00		
	5	73	29.00	5	26.00	19	27.00		
	6	73	12.00	2	23.00				
	7	73	16.00	14	7.50				
	8	73	20.00	11	36.00				
2312E3	9	72	58.00	16	27.00				
	10	72	43.00	14	33.00				
	11	72	237.00	4	204.00				
	12	72	145.00	2	232.00				
	1	73	145.00	6	100.00				
	2	73	237.00	3	341.00				
	3	73	706.00	3	162.00				
	4	73	378.00	7	208.00	21	491.00		
	5	73	145.00	5	129.00	19	135.00		
	6	73	62.00	2	119.00				
	7	73	90.00	14	42.00				
	8	73	100.00	11	178.00				

TRIBUTARY FLOW INFORMATION FOR MAINE 6/25/74

LAKE CODE 2312 SEBASTICOOK LAKE

MEAN MONTHLY FLOWS AND DAILY FLOWS

TRIBUTARY	MONTH	YEAR	MEAN FLOW	DAY	FLOW	DAY	FLOW	DAY	FLOW
2312E4	9	72	135.00	16	63.00				
	10	72	100.00	14	77.00				
	11	72	511.00	4	439.00				
	12	72	356.00	2	570.00				
	1	73	360.00	6	248.00				
	2	73	552.00	3	795.00				
	3	73	1500.00	3	345.00				
	4	73	810.00	7	446.00	21	1050.00		
	5	73	353.00	5	314.00	19	328.00		
	6	73	147.00	2	282.00				
	7	73	231.00	14	109.00				
	8	73	270.00	11	481.00				
2312F1	9	72	32.00	16	15.00				
	10	72	24.00	14	18.00				
	11	72	98.00	4	84.00				
	12	72	68.00	2	109.00				
	1	73	56.00	6	39.00				
	2	73	75.00	3	108.00				
	3	73	171.00	3	39.00				
	4	73	152.00	7	84.00	21	198.00		
	5	73	78.00	5	69.00	19	73.00		
	6	73	29.00	2	56.00				
	7	73	56.00	13	21.00				
	8	73	69.00	11	123.00				
2312ZZ	9	72	32.00						
	10	72	24.00						
	11	72	127.00						
	12	72	107.00						
	1	73	120.00						
	2	73	169.00						
	3	73	412.00						
	4	73	199.00						
	5	73	102.00						
	6	73	43.00						
	7	73	68.00						
	8	73	79.00						

APPENDIX B

PHYSICAL and CHEMICAL DATA

K - Value is less than indicated
J - Value known to be in error

STORET RETRIEVAL DATE 74/06/25

231201
44 51 30.0 069 13 00.0
SEBASTICOOK LAKE
23 MAINE

11EPALES
5

2111202
0010 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/08	08 28	0000	18.5	9.8	72	120	7.40	24	0.020	0.060	0.032	0.022
	08 28	0010	17.4	6.5		130	7.10	30	0.020	0.180	0.044	0.024
72/08/07	10 30	0000			40	150	8.80	29	0.040	0.050	0.059	0.030
	10 30	0004	22.8	10.4		145	8.90	28	0.050	0.060	0.072	0.030
	10 30	0008	22.8	10.4		140	8.90	29	0.060	0.080	0.062	0.029
72/10/03	07 35	0000			33	140	7.80	29	0.040	0.090	0.092	0.030
	07 35	0004	16.0	10.0		140	8.00	29	0.040	0.050	0.075	0.026
	07 35	0010	16.0	9.0		140	7.60	30	0.040	0.050	0.075	0.028

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/08	08 28	0000	5.0J
72/08/07	10 30	0000	96.1J
72/10/03	07 35	0000	98.9J

STORET RETRIEVAL DATE 74/06/25

231202
44 52 48.0 069 15 30.0
SEBASTICOOK LAKE
23 MAINE

11EPALES
3

2111202
0005 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/08	08 47	0000	18.4	7.2	48	140	7.10	36	0.050	0.150	0.050	0.026
	08 47	0005	18.5	6.6		140	7.10	35	0.040	0.130	0.064	0.028
72/08/07	10 50	0000			36	150	8.30	30	0.040	0.090	0.048	0.020
	10 50	0004	21.9	9.0		150	8.30	30	0.050	0.090	0.050	0.020
72/10/03	07 55	0000			31	140	7.40					
	07 55	0004	15.8	9.0		140	7.30					
	07 55	0014	15.8	7.5		140	7.40					

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/08	08 47	0000	63.9J
72/08/07	10 50	0000	21.3J
72/10/03	07 55	0000	80.0J

STORET RETRIEVAL DATE 74/06/25

231203
44 50 48.0 069 16 36.0
SEBASTICOOK LAKE
23 MAINE

11EPALES
3

2111202
0010 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00010 WATER TEMP CENT	00300 DO MG/L	00077 TRANSP SECCHI INCHES	00094 CNDUCTVY FIELD MICROMHO	00400 PH SU	00410 T ALK CACO3 MG/L	00630 NO2&NO3 N-TOTAL MG/L	00610 NH3-N TOTAL MG/L	00665 PHOS-TOT MG/L P	00666 PHOS-DIS MG/L P
72/06/08	09	00 0000	17.5		54	130	7.50	30	0.020	0.020	0.025	0.011
	09	00 0010	17.3			140	7.90	29	0.010	0.040	0.020	0.012
72/08/07	11	11 0000				150	7.30	29	0.050	0.060	0.045	0.017
	11	11 0004	20.8	6.4		150	7.00	31	0.050	0.060	0.040	0.021
	11	11 0008	20.8	6.8		150	7.20	30	0.040	0.060	0.038	0.020
72/10/03	08	15 0000			38	140	7.75					
	08	15 0004	15.1	9.4		140	7.80					

DATE FROM TO	TIME OF DAY	DEPTH FEET	32217 CHLRPHYL A UG/L
72/06/08	09	00 0000	22.9J
72/08/07	11	11 0000	15.8J
72/10/03	08	15 0000	41.2J

APPENDIX C

TRIBUTARY and WASTEWATER TREATMENT PLANT DATA

K - Value is less than indicated
J - Value known to be in error

STORET RETRIEVAL DATE 74/06/25

2312A1 LS2312A1
44 53 30.0 069 08 30.0
STETSON STREAM
23 15 STETSON
T/SEBASTICOOK LAKE
ST HWY 143 BRDG S OF STETSOW
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	13 30		0.037	1.980	0.052	0.005K	0.012
72/10/14	11 30		0.065	0.600	0.078	0.005K	0.013
72/11/04	09 55		0.022	0.670	0.050	0.005K	0.017
72/12/02	11 00		0.010K	0.290	0.009	0.005K	0.015
73/01/06	13 30		0.026	0.500	0.023	0.005K	0.009
73/02/03	14 00		0.039	0.370	0.026	0.005K	0.015
73/03/03	14 00		0.105	0.460	0.066	0.005K	0.005K
73/04/07	12 45		0.048	0.260	0.009	0.005K	0.010
73/04/21	10 15		0.011	1.700	0.058	0.005K	0.020
73/05/05	10 00		0.016	1.200	0.063	0.005K	0.010
73/05/19	10 00		0.010K	0.270	0.036	0.005K	0.010
73/06/02	13 00		0.010K	0.320	0.019	0.007	0.015
73/07/14	13 00		0.011	0.580	0.033	0.005K	0.025
73/08/11	09 56		0.010K	0.460	0.021	0.005K	0.020

STORET RETRIEVAL DATE 74/06/25

231281 LS2312B1
44 53 30.0 069 10 00.0
STREAM DRAINING GREENBUSH SWAMP
23 15 STETSON
T/SEBASTICOOK LAKE
ST HWY 222 BRDG W OF STETSON
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	13 45		0.096	0.550	0.091	0.005K	0.011
72/10/14	11 10		0.034	0.450	0.054	0.005K	0.008
72/11/04	09 45		0.028	0.420	0.026	0.005K	0.008
73/02/03	12 00		0.105	1.080	0.042	0.005K	0.010
73/04/07	11 15		0.075	0.150	0.007	0.005K	0.005K
73/04/21	10 00		0.010K	0.370	0.013	0.005K	0.005K
73/05/05	10 00		0.029	1.200	0.052	0.005K	0.010
73/05/19	09 30		0.019	0.230	0.014	0.005K	0.010
73/06/02	10 30		0.020	0.600	0.020	0.005K	0.007
73/07/14	12 15		0.010K	0.345	0.011	0.005K	0.005K
73/08/11	09 50		0.010K	0.440	0.010	0.005K	0.025

STORET RETRIEVAL DATE 74/06/25

2312C1 LS2312C1
44 53 30.0 069 11 30.0
STREAM DRAINING BROOKS POND
23 15 STETSON
T/SEBASTICOOK LAKE
ST HWY 222 BROG W OF STETSON
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	13 55		0.190	0.880	0.063	0.005K	0.012
72/10/14	11 00		0.250	0.400	0.115	0.005K	0.008
72/11/04	09 40		0.190	0.440	0.031	0.005K	0.008
72/12/02	09 00		0.300	0.290	0.013	0.005K	0.012
73/01/06	12 00		0.625	0.420	0.022	0.005K	0.008
73/04/07	11 00		0.530	0.180	0.021	0.005K	0.005K
73/04/21	09 20		0.320	0.730	0.019	0.005K	0.005K
73/05/05	09 30		0.390	1.380	0.061	0.005K	0.005K
73/05/19	09 10		0.336	0.320	0.060	0.005K	0.010
73/06/02	10 00		0.336	0.300	0.009	0.010	0.010
73/07/14	11 45		0.580	0.460	0.014	0.005K	0.005K
73/08/11	09 45		0.410	0.335	0.009	0.005K	0.015

STORET RETRIEVAL DATE 74/06/25

2312E1 LS2312E1
45 01 30.0 069 17 30.0
E AR SEBASTICOOK RIVER
23 15 GUILFORD
1/SEBASTICOOK LAKE
1ST BRDG BELO LK WASSOOKEEGOUTLET
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	12 35		0.034		0.044	0.005K	0.010
72/10/14	10 45		0.091	0.400	0.096	0.005K	0.008
72/12/02	14 30		0.052	0.190	0.008	0.005K	0.012
73/02/03	15 50		0.273	0.480	0.058	0.032	0.115
73/03/03	14 45		0.132	0.190	0.052	0.005K	0.005K
73/04/07	14 30		0.210	0.200	0.022	0.005K	0.015
73/04/21	11 15		0.138	0.300	0.018	0.005K	0.005K
73/05/05	11 30		0.084	0.190	0.014	0.005K	0.010
73/05/19	10 00		0.042	0.330	0.012	0.005K	0.015
73/06/02	14 30		0.020	0.240	0.013	0.008	0.015
73/07/14	14 30		0.016	0.400	0.024	0.005K	0.010
73/08/11	10 50		0.010K	0.230	0.007	0.005K	0.020

STORET RETRIEVAL DATE 74/06/25

2312E2 LS2312E2
44 57 03.0 069 15 03.0
E BR SEBASTICOOK RIVER
23 15 PITTSFIELD
1/SEBASTICOOK LAKE
BRDG AT LINCOLN MILLS BELO DEXTER STP
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	13 00		0.550	0.500	0.084	0.06A	0.120
72/10/14	10 10		0.230	0.450	0.086	0.040	0.062
72/11/04	10 15		0.210	0.560	0.075	0.020	0.044
72/12/02	14 00		0.231	0.660	0.033	0.016	0.038
73/02/03	14 30		0.330	0.480	0.035	0.022	0.070
73/04/07	14 15		0.280	0.230	0.006	0.005K	0.020
73/04/21	10 45		0.200	0.560	0.021	0.020	0.040
73/05/05	11 00		0.210	2.780	0.097	0.022	0.057
73/05/19	09 45		0.105	1.050	0.039	0.024	0.065
73/06/02	14 00		0.105	0.370	0.024	0.038	0.070
73/08/11	10 20		0.280	0.460	0.033		0.150

STORET RETRIEVAL DATE 74/06/25

2312E3 LS2312E3
44 53 00.0 069 15 00.0
E BR SEBASTICOOK RIVER
23 15 PITTSFIELD
I/SEBASTICOOK RIVER
BRDG S OF CORINNA BELOW CORINNA WST DISC
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	10	50	0.117	3.650	0.920	0.033	0.154
72/10/14	09	55	0.110	3.150	0.700	0.007	0.082
72/11/04	09	30	0.070	1.800	0.410	0.013	0.071
72/12/02	09	20	0.280	1.150	0.170	0.013	0.046
73/04/07	10	30	0.330	0.700	0.078	0.005K	0.030
73/04/21	09	00	0.154	1.150	0.131	0.005K	0.045
73/05/05	09	15	0.170	4.100	0.336	0.006	0.055
73/05/19	09	40	0.064	1.600	0.410	0.010	0.065
73/06/02	09	30	0.092	1.050	0.210	0.016	0.060
73/07/14	11	00	0.060	1.800	0.300	0.016	0.108
73/08/11	09	35	0.037	2.520	0.530	0.075	0.210

STORET RETRIEVAL DATE 74/06/25

2312E4 LS2312E4
44 50 30.0 069 16 30.0
E BR SEBASTICOOK RIVER
23 15 PITTSFIELD
0/SEBASTICOOK LAKE
BRDG IN NEWPORT AT DAM SPILLWAY
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	14 20		0.051	1.050	0.099	0.028	0.086
72/10/14	09 30		0.033	1.050	0.060	0.014	0.074
72/12/02	09 45		0.050	0.800	0.110	0.008	0.054
73/01/06	09 30		0.073	0.680	0.138	0.007	0.026
73/02/03	10 00		0.096	0.720	0.126	0.009	0.020
73/03/03	09 00		0.189	0.650	0.120	0.005K	0.020
73/04/07	09 30		0.460	0.540	0.046	0.005K	0.020
73/04/21	08 00		0.336	0.890	0.069	0.006	0.020
73/05/05	08 30		0.231		0.120	0.008	0.065
73/05/19	08 40		0.190	0.660	0.030	0.008	0.055
73/06/02	08 30		0.160	0.820	0.093	0.012	0.040
73/07/14	09 30		0.025	0.680	0.046	0.006	0.040
73/08/11	09 15		0.010K	1.050	0.052	0.017	0.055

STORET RETRIEVAL DATE 74/06/25

2312F1 LS2312F1
44 53 30.0 069 16 30.0
MULLIGAN STREAM
23 15 PITTS FIELD
T/SEBASTICOOK LAKE
ST HWYS 7/11 BRDG SSW COR INA
11EPALES 2111204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P
72/09/16	11 15		0.051	1.300	0.069	0.005K	0.016
72/10/14	09 50		0.056	1.200	0.062	0.005K	0.014
72/11/04	09 25		0.104	0.820	0.031	0.005K	0.014
72/12/02	10 00		0.339		0.026	0.005K	0.014
73/04/07	10 10		0.550	0.360	0.026	0.005K	0.010
73/04/21	08 30		0.350	0.720	0.032	0.005K	0.015
73/05/05	09 00		0.220	1.200	0.072	0.005K	0.015
73/05/19	08 45		0.138	0.400	0.027	0.005K	0.015
73/06/02	09 00		0.115	0.630	0.027	0.010	0.020
73/07/13	10 15		0.120	0.570	0.027	0.005K	0.020
73/08/11	08 30		0.010K	0.750	0.040	0.012	0.035

STORET RETRIEVAL DATE 74/06/25

231250 AS231250 P000750
45 55 00.0 069 15 30.0
CORINNA
23 15 PITTSFIELD
T/SEBASTICOOK LAKE
SEBASTICOOK RIVER
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/01/31	07 00								
CP(T)-			0.120	27.300	1.200	0.065	0.595	1.480	1.430
73/02/01	06 00								
73/02/15	07 00								
CP(T)-			0.175	48.000	2.900	0.120	1.400	1.330	1.330
73/02/16	06 00								
73/03/22	07 00								
CP(T)-			0.170	34.000	2.600	0.140	0.620	1.450	1.300
73/03/23	06 00								
73/04/24	07 00								
CP(T)-			0.086	63.000	3.700	0.250	1.700	1.130	
73/04/25	07 00								
73/06/27	07 00								
CP(T)-			0.115	61.500	14.500	0.450	1.950	1.290	0.947
73/06/28	06 00								
73/08/14	07 00								
CP(T)-			0.168	47.000	7.900	0.610	1.580	1.400	
73/08/15	06 00								
73/08/27	07 00								
CP(T)-			0.147	35.700	11.200	0.150	0.560	1.230	1.170
73/08/28	06 00								
73/09/26	07 00								
CP(T)-			0.250	43.000	4.400	0.390	3.000	1.400	1.300
73/09/27	07 00								
73/11/06	07 00								
CP(T)-			0.100	52.000	6.100	0.210	1.050	1.150	1.150
73/11/07	06 00								

STORET RETRIEVAL DATE 74/06/25

231251 AS231251 P002000
45 55 00.0 069 15 30.0
CORINNA BYPASS
23 15 PITTSFIELD
T/SEBASTICOOK LAKE
SEBASTICOOK RIVER
11EPALES 2141204
4 0000 FEET DEPTH

DATE FROM TO	TIME OF DAY	DEPTH FEET	00630 NO2&NO3 N-TOTAL MG/L	00625 TOT KJEL N MG/L	00610 NH3-N TOTAL MG/L	00671 PHOS-DIS ORTHO MG/L P	00665 PHOS-TOT MG/L P	50051 FLOW RATE INST MGD	50053 CONDUIT FLOW-MGD MONTHLY
73/01/31	07 00								
CP(T)-			0.300	0.580	0.150	0.005K	0.045		
73/02/01	06 00								
73/02/15	07 00								
CP(T)-			0.380	0.510	0.200	0.035	0.045		
73/02/16	06 00								